ABSTRACT

A method to improve the frequency resolution and phase noise of a synthesized RF signal results in superior instantaneous frequency change and phase modulation capability, wide frequency set ability, and suitability for implementation in a digital ASIC. The RF signal synthesis is achieved from a higher reference frequency clock signal using a variable pulse stretching technique. The amount of the pulse stretch in each cycle is set by a phase increment value and is implemented using programmable delay lines. Pulse stretching can be extended beyond one cycle by pulse swallowing, allowing the generation of an RF signal with frequencies from DC up to the input reference frequency. Phase modulation is incorporated by digital control of the phase stretching with the phase modulation bits.